

SAFE HAVEN ASSETS IN STOCK INVESTMENTS ON THE INDONESIAN STOCK EXCHANGE: AN EMPIRICAL STUDY DURING THE COVID-19 PANDEMIC

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Abstract

Safe haven assets are secure investment during times of economic downturn. This study aims at analysing the roles of three safe haven assets, Bitcoin, gold, and US dollars, during the COVID-19 pandemic. By conducting a time series analysis of returns on stocks, gold, Bitcoin, and US dollars between 2020 and 2022 using Vector Auto Regression (VAR) method, this study found the empirical evidence that suggests a negative correlation between gold and IDX, and between US dollars and IDX. Therefore, it can be concluded that gold and US dollars are safe haven assets in the IDX market. Meanwhile, despite being less resilient than gold and US dollars, Bitcoin's independence from stocks during bearish markets makes it a safe haven asset.

Keywords

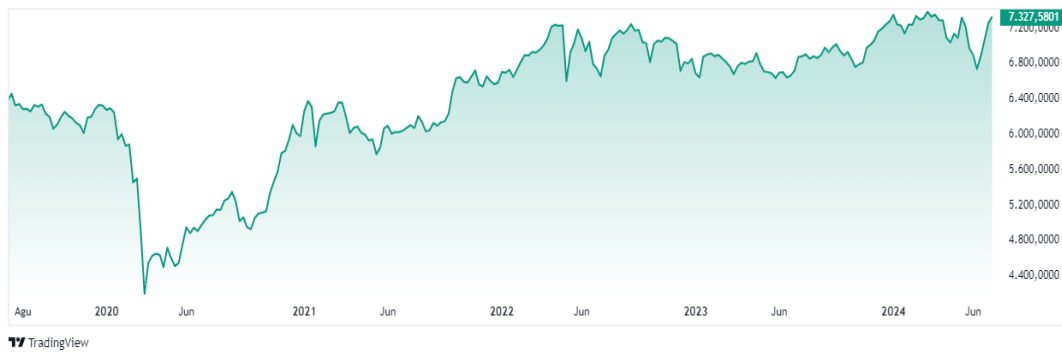
Safe haven, Vector Auto Regression, Bitcoin, Gold, USD, IDX, COVID-19

Introduction

Stocks are financial assets whose performance reflects economic conditions. Stock price movement is even considered a leading indicator of economic cycles (Bodie, et al., 2022). The economy experiences regular cycles of expansion and contraction, known as business cycles. Empirical evidence suggests that the cycles vary in length and depth. In other words, how long one cycle lasts is unknown. In the face of market uncertainties, an investor needs to select the best-fit investments to avoid heavy losses during times of crisis. This type of investment is classified as a safe haven, an investment that sustains or grows in value when the market is volatile; it is a protection that helps investors limit their losses during market downswings.

Some instruments, such as gold, US dollars, and crypto assets, are classified as a safe haven. Gold is often considered a safe investment during economic turbulence. In addition to gold, US dollar is a safe haven currency due to its market liquidity, stability (compared with other instruments), and attractive returns. Regarding crypto assets, some studies classified Bitcoin as safe haven assets due to its significant growth in the global market capitalization. By 2022, the period of this study, crypto assets capitalization had reached 2.07 trillion USD, with Bitcoin holding the largest market share.

Baur & Lucey (2010) defined a safe haven as an asset that exhibits no correlation, or a negative correlation, with other assets or portfolios during times of market volatility or distress. A key characteristic of safe haven assets is their non-positive correlation with other portfolios during extreme market conditions. A negative correlation with another asset or portfolio during severe market conditions indicates that prices of safe haven assets rise when prices of other assets or portfolios decline, thereby helping compensate investors for their losses. However, under normal or improved market conditions, this correlation may become positive.



Source: Tradingview.com

Figure 1 Stock Price Movement 2020 - 2024

Figure 1 exhibits that the stock market encountered severe turbulence and fell into a correction at the beginning of the pandemic in 2020. During the period, stock prices plummeted. However, as can be seen in Figure 2, 3 and 4, prices of Bitcoin, gold, and US dollars around the same period skyrocketed. In other words, during market turmoil, Bitcoin, gold, and US dollar assets negatively correlate with stock prices.



Source: Investing.com

Figure 2 Bitcoin Price Movement 2020 - 2022



Source: Tradingview.com

Figure 3 Gold Price Movement 2020 - 2024

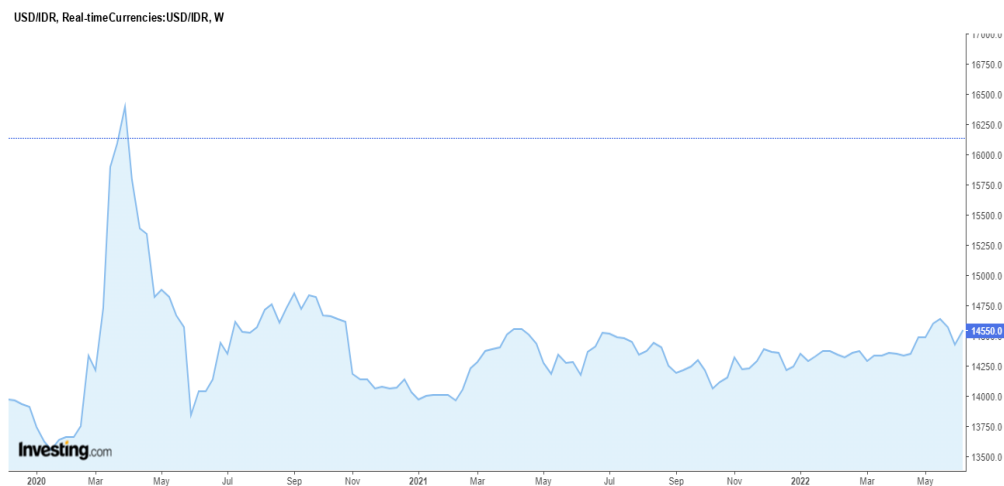


Figure 4 USD/IDR Movement 2020 – 2022

Considering the above empirical facts, this study aims at determining whether Bitcoin, gold, and USD are considered safe haven assets in stock investment on the Indonesian Stock Exchange during the COVID-19 pandemic. Observation of safe haven assets must be conducted during the bearish market phase when the market is highly volatile, making the COVID-19 pandemic a suitable period for such a study. The International Monetary Fund (IMF) has even concluded that the recession caused by the COVID-19 pandemic is worse than the global recession of 2008.

Numerous studies have been conducted to determine whether certain assets can be classified as safe haven assets. Empirical studies, including Baur & Lucey (2010); Liu et al., (2016); Wen & Cheng (2017); Robiyanto (2018); Nguyen et al (2020); Yuliana & Robiyanto (2021); Adiputri & Robiyanto (2021); Cheema et al (2022), have proved that gold and USD are safe havens. However, the results of studies on the Bitcoin as a safe haven asset vary greatly. While Ethereum can be considered a safe haven, other crypto assets, such as Bitcoin and Ripple, are not. Another study, however, indicated that Ethereum, Bitcoin and gold failed to serve as safe havens during the Russia-Ukraine war (Boungou & Yatié, 2022). Conversely, a different study examining instruments like Bitcoin under different conditions found that only Bitcoin could act as a safe haven. (Balcilar et al., 2021). Melin et al. (2022) conducted a study on safe haven assets in the US financial market during the COVID-19 pandemic and found that neither Bitcoin nor gold could be considered safe havens. However, both assets were found to function as diversifiers in both markets.

Including safe haven assets in investment portfolios is an attempt to diversify and minimise risks during a bearish market. Numerous studies have confirmed that gold and the USD are safe haven assets, but no study has ever reached a consensus on Bitcoin being a safe haven asset. Considering the importance of risk management for investors and the limited number of studies on crypto assets, particularly Bitcoin, as safe havens in Indonesia during recessions caused by the COVID-19 pandemic, this study aims to analyse whether gold, the USD, and Bitcoin function as safe haven assets on the Indonesian Stock Exchange during a bearish market. Studies on safe haven assets should focus on periods of bearish and highly volatile markets, such as the COVID-19 pandemic or other recession periods as the roles of safe haven assets can be more accurately analysed during these times. It is therefore expected that this study will support other similar studies on the financial markets in Indonesia that were not conducted during periods of extreme market pressure.

Theoretical Framework

Safe Haven, Hedge, and Diversification

Safe haven and hedge are two widely recognized concepts in investment risk management. While hedging is an investment strategy involving assets that are negatively correlated with other investments or portfolios on average, a safe haven refers to an investment or portfolio that is negatively correlated with other investments or portfolios during a market turbulence. According to Baur & Lucey (2010), a safe haven is an asset that, amid market distress or instability, shows either no correlation, or a negative correlation, with other assets or portfolios. It is specifically characterised by its non-positive correlation with other portfolios under extreme market conditions, indicating either no correlation or a negative correlation on average. In normal condition, or when market is stable, this correlation may become positive or negative. Under severe market conditions, a safe haven that exhibits a negative correlation provides compensation to investors as its price rises when prices of other portfolios decline and allows them to mitigate risks during market turbulence. Baur & Lucey (2010) studied the US, Germany, and the UK's

financial market and found that gold functions as a hedge against stocks and is a safe haven during extreme stock market conditions.

Hedging is an investment strategy aimed at mitigating the risks of price movements that could lead to losses. This strategy, which involves diversification of instruments, is frequently implemented to balance investment assets. A good hedge effectively compensates for the risks faced by a position or portfolio. An investment instrument that exhibits a negative correlation with sensitive assets under normal market conditions can be considered a hedge.

According to Baur & Lucey (2010), diversifiers refer to assets that typically have a positive correlation, although imperfect, with other assets or portfolios. Diversification benefits investors by reducing portfolio risks through inclusion of assets with positive correlations (Bodie et al, 2022). Diversification is not specifically designed to minimise losses during market turbulence as its correlation holds primarily under normal conditions, not during extreme market events.

Wen & Cheng (2017) conducted a study on gold and the USD as safe haven assets in emerging markets, including Brazil, Chile, Czech Republic, Russia, South Africa, China, India, Malaysia, and Thailand. Their study confirmed that gold and the USD are safe havens in these markets, with the USD being more powerful than gold in many cases. Similarly, gold is often considered a safe haven in developing countries.

Cheema et al. (2022) compared the performance of safe haven assets in two different distressed markets, the 2008 global recession and the COVID-19 pandemic. They examined the stock markets of the 10 largest economies in the world and found that gold served as a safe haven during the global financial crisis, but not during the COVID-19 pandemic.

Kliber et al. (2019) stated that safe haven assets typically exhibit a negative correlation during financial crises. They agreed that safe havens are assets that are not correlated, or negatively correlated, during extreme market period. They used stochastic volatility to explore the roles of Bitcoin as a safe haven, hedging, or a diversifier in Venezuela, Japan, China, Sweden, and Estonia. The study confirmed that Bitcoin serves as a safe haven in Venezuela and as a diversifier in Japan and China. Meanwhile, in countries where Bitcoin is legalised, such as Sweden and Estonia, Bitcoin acts as a weak hedge against traditional market fluctuations.

Research Method

The International Monetary Fund (IMF) stated that recession caused by the COVID-19 pandemic is worse than the 2008 global recession. Considering this, the study focuses on examining the stock market during the financial distress caused by the pandemic to analyse the role of gold, USD, and Bitcoin in stock investments on the Indonesian Stock Exchange. Daily Jakarta Composite Index values, Bitcoin prices, gold prices, and USD exchange rates from 2020 to 2022 were analysed to examine the correlations between study variables using the Vector Autoregression (VAR) analysis method. The VAR method was selected based on the potential for a bi-directional causality between the study variables.

The model specification is inherently based on the interaction between variables that follow the VAR model structure, which helps in analysing causality between the variables. The general model, VAR with lag k:

$$y_{1t} = \beta_{10} + \beta_{11}y_{1t-1} + \dots + \beta_{1k}y_{1t-k} + \alpha_{11}y_{2t-1} + \dots + \alpha_{1k}y_{2t-k} + u_{1t}$$

$$y_{2t} = \beta_{20} + \beta_{21}y_{2t-1} + \dots + \beta_{2k}y_{2t-k} + \alpha_{21}y_{1t-1} + \dots + \alpha_{2k}y_{1t-k} + u_{2t}$$

u_{it} are white noise error term.

Results

The results of the data stationarity test for all variables using Augmented Dickey Fuller test are presented in Table 1 – Table 4 below.

Null Hypothesis: RETURN_BITCOIN has a unit root		
Exogenous: Constant		
Lag Length: 4 (Automatic - based on SIC, maxlag=19)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.347978	0.0000
Test critical values: 1% level	-3.439192	
*MacKinnon (1996) one-sided p-values.		

Table 1 Unit Root Test for Bitcoin Return

Null Hypothesis: RETURN_GOLD has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on SIC, maxlag=19)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-15.49023	0.0000
Test critical values: 1% level	-3.439192	

*MacKinnon (1996) one-sided p-values.

Table 2 Unit Root Test for Gold Return

Null Hypothesis: RETURN_USD has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on SIC, maxlag=19)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-10.90612	0.0000
Test critical values: 1% level	-3.439192	

*MacKinnon (1996) one-sided p-values.

Table 3 Unit Root Test for USD Return

Null Hypothesis: RETURN_STOCK has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on SIC, maxlag=19)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.25238	0.0000
Test critical values: 1% level	-3.439192	

*MacKinnon (1996) one-sided p-values.

Table 4 Unit Root Test for Stock Return

Tables 1 to 4 exhibit that all data to be analysed using the VAR method are stationary at level. Given that the data are stationary, the VAR estimation model was constructed using an optimum lag length of 5. This lag was selected based on the test results presented in Table 5 below.

VAR Lag Order Selection Criteria

Endogenous variables: RETURN_BITCOIN RETURN_USD RETURN_GOLD
 RETURN_STOCK

Included observations: 718

Lag	LogL	LR	FPE	AIC	SC	HQ
0	2001.923	NA	4.50e-08	-5.565244	-5.539749	-5.555400
1	2051.597	98.65718	4.10e-08	-5.659045	-5.531567	-5.609825
2	2098.771	93.16559	3.76e-08	-5.745881	-5.516420	-5.657285
3	2231.137	259.9374	2.72e-08	-6.070018	-5.738575	-5.942046
4	2479.707	485.3701	1.42e-08	-6.717847	-6.284421	-6.550499
5	2547.947	132.4881	1.23e-08*	-6.863362*	-6.327953*	-6.656638*
6	2554.210	12.08943	1.26e-08	-6.836239	-6.198847	-6.590139

Table 5 Optimum Lag Test Results

Figure 5 presents results of VAR stability test, indicating that the polynomial has no roots on the unit circle. Therefore, it can be concluded that the VAR estimation model exhibits no explosive structures.

Inverse Roots of AR Characteristic Polynomial

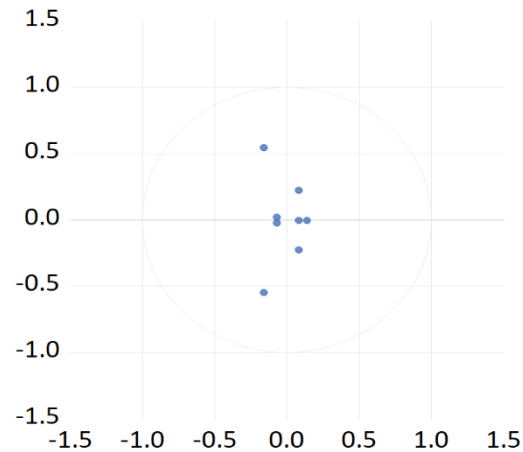


Figure 5

A series of diagnostic tests presented above generated the VAR estimation results, which are shown in Table 6 below.

Vector Autoregression Estimates
Included observations: 721 after adjustments
Standard errors in () & t-statistics in []

	RETURN_BITCOIN	RETURN_USD	RETURN_GOLD	RETURN_STOCK
RETURN_BITCOIN(-1)	0.267087 (0.03717) [7.18485]	-0.290826 (0.15533) [-1.87233]	-0.340449 (0.12400) [-2.74553]	-0.279126 (0.15591) [-1.79025]
RETURN_BITCOIN(-2)	-0.072801 (0.03780) [-1.92605]	-0.104652 (0.15794) [-0.66262]	-0.018193 (0.12608) [-0.14429]	-0.116537 (0.15853) [-0.73510]
RETURN_BITCOIN(-3)	0.219465 (0.03700) [5.93156]	0.179917 (0.15460) [1.16375]	0.212200 (0.12342) [1.71933]	0.197090 (0.15518) [1.27004]
RETURN_BITCOIN(-4)	0.180299 (0.03761) [4.79344]	-0.275535 (0.15717) [-1.75314]	-0.223736 (0.12547) [-1.78320]	-0.281246 (0.15776) [-1.78275]
RETURN_BITCOIN(-5)	-0.122614 (0.03701) [-3.31316]	2.71E-05 (0.15464) [0.00018]	0.123481 (0.12345) [1.00026]	0.003171 (0.15522) [0.02043]
RETURN_USD(-1)	0.018947 (0.06636) [0.28551]	0.879283 (0.27730) [3.17089]	0.827385 (0.22137) [3.73754]	0.882233 (0.27834) [3.16958]
RETURN_USD(-2)	-0.055686 (0.06575) [-0.84694]	0.319240 (0.27473) [1.16200]	0.332580 (0.21932) [1.51639]	0.312763 (0.27577) [1.13415]
RETURN_USD(-3)	-0.062789 (0.06537) [-0.96052]	0.464486 (0.27314) [1.70053]	0.241979 (0.21805) [1.10972]	0.465931 (0.27417) [1.69941]

RETURN_USD(-4)	-0.033578 (0.06522) [-0.51482]	0.282118 (0.27253) [1.03518]	0.297423 (0.21756) [1.36705]	0.251973 (0.27356) [0.92109]
RETURN_USD(-5)	0.014798 (0.06518) [0.22705]	-0.286861 (0.27234) [-1.05333]	-0.205488 (0.21741) [-0.94516]	-0.283121 (0.27337) [-1.03569]
RETURN_GOLD(-1)	0.030898 (0.01648) [1.87536]	-0.529886 (0.06884) [-7.69689]	-0.552123 (0.05496) [-10.0460]	-0.537000 (0.06910) [-7.77092]
RETURN_GOLD(-2)	0.026224 (0.01724) [1.52077]	-0.446768 (0.07205) [-6.20059]	-0.501822 (0.05752) [-8.72422]	-0.449338 (0.07232) [-6.21283]
RETURN_GOLD(-3)	0.043284 (0.01712) [2.52873]	-0.455873 (0.07152) [-6.37380]	-0.293259 (0.05710) [-5.13608]	-0.456102 (0.07179) [-6.35305]
RETURN_GOLD(-4)	-0.009483 (0.01612) [-0.58816]	-0.173017 (0.06737) [-2.56813]	-0.195237 (0.05378) [-3.63007]	-0.130621 (0.06762) [-1.93156]
RETURN_GOLD(-5)	0.040147 (0.01569) [2.55838]	0.245587 (0.06557) [3.74544]	0.235971 (0.05235) [4.50799]	0.244327 (0.06582) [3.71224]
RETURN_STOCK(-1)	-0.026584 (0.06515) [-0.40805]	-0.900421 (0.27222) [-3.30770]	-0.822099 (0.21732) [-3.78295]	-0.902245 (0.27325) [-3.30195]
RETURN_STOCK(-2)	0.045753 (0.06444) [0.70998]	-0.326622 (0.26927) [-1.21297]	-0.331569 (0.21497) [-1.54243]	-0.322396 (0.27029) [-1.19278]
RETURN_STOCK(-3)	0.050323 (0.06414) [0.78457]	-0.515671 (0.26801) [-1.92407]	-0.463469 (0.21396) [-2.16618]	-0.523124 (0.26902) [-1.94455]
RETURN_STOCK(-4)	0.072479 (0.06420) [1.12898]	-0.496215 (0.26825) [-1.84983]	-0.476658 (0.21415) [-2.22584]	-0.508187 (0.26926) [-1.88734]
RETURN_STOCK(-5)	-0.020709 (0.06420) [-0.32255]	0.393180 (0.26827) [1.46563]	0.347689 (0.21416) [1.62349]	0.385049 (0.26928) [1.42993]
C	0.025175 (0.01034) [2.43457]	-0.542390 (0.04321) [-12.5532]	-0.512560 (0.03449) [-14.8599]	-0.549791 (0.04337) [-12.6767]

Table 6 VAR Estimation Results

The t-statistics presented in the VAR estimation table above highlight the correlations between markets, summarised in the table below.

	Significant positive correlation	Significant negative correlation	No correlation
Stock Return – Gold Return		√	√
Stock Return – USD Return		√	√
Stock Return – Bitcoin Return			√

Table 7 Summary of the VAR Estimation Results

According to Baur and Lucey (2010), when two assets demonstrate a significant negative correlation, or no correlation, during market distress, one of the two assets acts as a safe haven for the other. The results of this study support the findings of the previous studies indicating that gold and USD function as safe haven assets in the stock market. It has also been found that return on stocks has no correlation with return on Bitcoin, making Bitcoin a safe haven asset in a distressed market situation, although this asset is weaker than gold and USD.

Since the Granger Causality test supports VAR interpretation (Brooks, C., 2014), it was conducted to analyse the relationships between study variables: return on Bitcoin, return on USD, return on gold, and return on stocks.

Pairwise Granger Causality Tests

Lags: 5

Null Hypothesis:	Obs	F-Statistic	Prob.
RETURN_STOCK does not Granger Cause RETURN_BITCOIN	721	1.53844	0.1756
RETURN_BITCOIN does not Granger Cause RETURN_STOCK		2.43432	0.0335
RETURN_STOCK does not Granger Cause RETURN_USD	721	1.99307	0.0776
RETURN_USD does not Granger Cause RETURN_STOCK		0.27056	0.9292
RETURN_STOCK does not Granger Cause RETURN_GOLD	721	11.5847	9.E-11
RETURN_GOLD does not Granger Cause RETURN_STOCK		22.0589	1.E-20

Table 8 Granger Causality Test Results

Results of the Granger causality test presented in Table 8 indicate significant bi-directional causality between the stock market and the gold commodities market, as well as uni-directional causality between the stock market and the USD exchange rate, and between the stock market and the Bitcoin market. These correlations demonstrate that the poor performance of most stocks during the COVID-19 pandemic led to shocks in the stock market and prompted investors to move to safer assets, such as Bitcoin, USD, and gold. In short, it has been empirically proven that the performance of all markets during the COVID-19 pandemic was correlated, as shown in Table 8.

Conclusion

This study examines the roles of gold, USD, and Bitcoin in stock investment on the Indonesian Stock Exchange during the COVID-19 pandemic and finds a significant bi-directional causality between the return on gold and the return on IDX from 2020 to 2022, when the COVID-19 pandemic struck. There has also been a significant uni-directional causality between the return on USD and the return on IDX, and the return on Bitcoin and the return on IDX. The VAR estimates and Granger Causality test results suggest that gold and USD are strong safe haven assets in the Indonesian Stock Exchange. Moreover, the VAR estimates also suggest that Bitcoin is a safe haven asset, although comparatively weaker than gold and USD.

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